



## AIRCRAFT ACCIDENT REPORT AND EXECUTIVE SUMMARY

				Reference:	CA18/2/3/9369	
<b>Aircraft Registration</b>	<b>ZS-TIC</b>	<b>Date of Accident</b>	31 July 2014		<b>Time of Accident</b>	0715Z
<b>Type of Aircraft</b>	Cessna 210N (Aeroplane)		<b>Type of Operation</b>		Private	
<b>Pilot-in-command Licence Type</b>		Commercial	<b>Age</b>	51	<b>Licence Valid</b>	Yes
<b>Pilot-in-command Flying Experience</b>		Total Flying Hours	1 248,6		Hours on Type	452,6
<b>Last point of departure</b>		Hunter's Moon airstrip, Northern Cape				
<b>Next point of intended landing</b>		Gariep Dam aerodrome, Free State				
<b>Location of the accident site with reference to easily defined geographical points (GPS readings if possible)</b>						
Hunter's Moon Safari Lodge (geographical coordinates 30°27'8" South 024°58'31" East)						
<b>Meteorological Information</b>		Wind: 315°5kt; Visibility: 10km; Temperature: 6° C; Cloud cover: Nil; Cloud base: Nil.				
<b>Number of people on board</b>	1 + 1	<b>No. of people injured</b>	0	<b>No. of people killed</b>	0	
<b>Synopsis</b>						
<p>The pilot took off from Hunter's Moon airstrip bound for Gariep Dam aerodrome.</p> <p>Shortly after take-off, at about 1 200ft above ground level (AGL), the engine stopped without warning. The pilot switched fuel tanks and attempted a restart, but was unsuccessful. He carried out a forced landing on an open stretch of veld.</p> <p>Neither the pilot nor his passenger was injured during the forced landing but the aircraft sustained substantial damage.</p> <p>The reason for the engine stoppage could not be determined. The aircraft was retrieved to a maintenance facility, where the engine operation was found to be normal.</p>						
<b>Probable Cause</b>						
<p>Unsuccessful forced landing following an engine failure shortly after take-off. The reason for the engine stoppage could not be determined.</p>						
IARC Date				Release Date		



## AIRCRAFT ACCIDENT REPORT

**Name of Owner** : Lima Romeo Air CC  
**Name of Operator** : Lima Romeo Air CC  
**Manufacturer** : Cessna Aircraft Company  
**Model** : 210N  
**Nationality** : South African  
**Registration Marks** : ZS-TIC  
**Place** : Hunter's Moon Safari Lodge, Northern Cape  
**Date** : 31 July 2014  
**Time** : 0715Z

*All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.*

### Purpose of the Investigation

*In terms of Regulation 12.03.1 of the Civil Aviation Regulations (1997), this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and **not to establish legal liability**.*

### Disclaimer

*This report is produced without prejudice to the rights of the CAA, which are reserved.*

## 1. FACTUAL INFORMATION

### 1.1 History of Flight

- 1.1.1 The pilot, accompanied by a passenger, took off from Hunter's Moon Safari Lodge on a private flight bound for Gariep Dam aerodrome. This was a private flight conducted under visual meteorological conditions (VMC) in daylight.
- 1.1.2 Approximately three minutes after take-off, at 1 200ft above ground level (AGL), the engine stopped without warning.
- 1.1.3 The pilot attempted a restart, but was too low at the time to carry this out successfully. He opted for a forced landing on an open stretch of veld at the coordinates 30°27'8" South 024°58'31" East, at an elevation of 4 100ft.
- 1.1.4 The pilot and passenger did not sustain any injuries during the accident.



**Figure 1:** The aircraft after coming to rest.

## 1.2 Injuries to Persons

Injuries	Pilot	Crew	Pass.	Other
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	1	-	1	-

## 1.3 Damage to Aircraft

- 1.3.1 The nose gear was ripped out and was destroyed. The left main gear undercarriage collapsed backwards.
- 1.3.2 Damage to the fuel selector was as a result of the nose gear actuator that was forced through the lower firewall during the sequence of the accident.



**Figure 2:** The damage to the propeller and dents on the lower fuselage can be seen here.

## 1.4 Other Damage

1.4.1 Minor damage was caused to the surrounding vegetation.

## 1.5 Personnel Information

Nationality	South African	Gender	Male	Age	51
Licence Number	0270268410	Licence Type	Commercial		
Licence valid	Yes	Type Endorsed	Yes		
Ratings	Instrument rating				
Medical Expiry Date	31 July 2015				
Restrictions	Corrective lenses				
Previous Accidents	No previous accidents on file				

### Flying Experience

Total Hours	1 248,6
Total Past 90 Days	10,5
Total on Type Past 90 Days	3,5
Total on Type	452,6



## 1.6 Aircraft Information

### Airframe

Type	C210N	
Serial Number	210-63232	
Manufacturer	Cessna Aircraft Company	
Year of Manufacture	1979	
Total Airframe Hours (At time of Accident)	5 009,0	
Last MPI (Date & Hours)	21 July 2014	5 005,5
Hours since Last MPI	3,5	
C of A (Issue Date)	25 March 2010	
C of R (Issue Date) (Present owner)	22 December 2012	
Operating Categories	Standard Part 91	

### Engine

Type	Continental IO-55-L-11B
Serial Number	28913-R
Hours since New	1 587,0
Hours since Overhaul	3,5

### Propeller

Type	Hartzell PHC-J3YF-1RF
Serial Number	FP8434B
Hours since New	Unknown
Hours since Overhaul	683,0

### Weight calculation

Aircraft empty weight	2 367,74lb
Pilot	230lb
Passenger	176lb
Fuel	96lb
<b>Total</b>	<b>2 869,74lb</b>

The aircraft's operating weight of 2 869,74lb was 930,26lb less than the maximum certified all-up weight of 3 800lb for this type of aircraft.

## 1.7 Meteorological Information

- 1.7.1 The weather conditions at the time and place of the accident were obtained from the pilot's questionnaire.

Wind direction	315°	Wind speed	5kt	Visibility	10 000m
Temperature	6°C	Cloud cover	Clear Sky	Cloud base	Nil
Dew point	Unknown				

## **1.8 Aids to Navigation**

- 1.8.1 The aircraft was equipped with standard navigational equipment as per the minimum equipment list approved by the regulator. No defects to this equipment were recorded prior to the flight.

## **1.9 Communications**

- 1.9.1 The aircraft was equipped with standard communication equipment as per the minimum equipment list approved by the regulator. No defects to this equipment were recorded prior to the flight.

- 1.9.2 The pilot communicated his intentions on VHF 124.8 MHz.

## **1.10 Aerodrome Information**

- 1.10.1 The accident occurred outside the boundaries of an aerodrome.

## **1.11 Flight Recorders**

- 1.11.1 The aircraft was not fitted with a cockpit voice recorder or flight data recorder. Neither was required by regulations to be fitted to this type of aircraft.

## **1.12 Wreckage and Impact Information**

- 1.12.1 The aircraft came to a stop with the left wing resting on the ground, as the left main landing gear had collapsed. The nose gear had also collapsed, causing the propeller to strike the ground.
- 1.12.2 The aircraft was in a level attitude and a landing configuration during the forced landing.

## **1.13 Medical and Pathological Information**

- 1.13.1 Not applicable.

## **1.14 Fire**

- 1.14.1 There was no pre- or post-impact fire.

## **1.15 Survival Aspects**

- 1.15.1 The accident was considered survivable due to the low kinetic forces involved and the fact that the occupants were wearing their safety harnesses.

## 1.16 Test and Research

1.16.1 The aircraft was recovered from the accident scene and taken to an aviation maintenance organisation (AMO). The engine was run in the airframe with a fuel supply connection directly from the engine compartment, as the fuel selector valve was reported to be damaged. The engine ran normally.

1.16.2 The engine was placed in a test cell where it also ran normally.

## 1.17 Organisational and Management Information

1.17.1 The last mandatory periodic inspection (MPI) before the accident was certified on 21 July 2014 at 5 005,5 airframe hours by an SACAA-approved AMO in possession of a valid AMO certificate.

1.17.2 The accident flight was a private flight. The pilot and a passenger collected the aircraft from the AMO after it was refurbished and the engine overhauled.

## 1.18 Additional Information

1.18.1 On 25 July, six days before the forced landing, the aircraft was refuelled at Port Alfred. Both tanks were filled, resulting in a usable fuel capacity of 87 US gallons. The engine fitted to this aircraft, a Teledyne Continental IO 550, burns on average 17 US gallons/hour, providing a normal endurance of five hours.

1.18.2 The aircraft had a newly overhauled engine. The engine is bedded in by operating it at high power using a mixture setting to maintain a safe oil temperature. Operating the engine at high power settings would have reduced the normal endurance.

1.18.3 After refuelling, the pilot flew from Port Alfred to Hunter's Moon Safari Lodge airstrip, a flight of 3,5 hours. According to the pilot, the fuel totaliser fitted to the aircraft reflected that 17 US gallons (approximately 65ℓ) remained on arrival at Hunter's Moon. The next flight undertaken in the aircraft was the accident flight to Gariep Dam aerodrome. As this was only a 12-minute flight, 17 US gallons would have been more than ample.

1.18.4 After the accident, the AMO recovery team drained 23 litres of fuel from the left wing tank. At the accident site, fuel was also found to be leaking from the damaged fuel selector; this was thought to be from the right wing as it was higher than the left wing after the aircraft came to rest. The amount of fuel that leaked from this tank could not be determined.

### 1.18.5 Fuel system

Excerpted from the Cessna 210 operations manual:

*"Fuel flows by gravity from the two integral fuel tanks to two reservoir tanks, and from the reservoir tanks to a three-position selector valve labelled LEFT ON, RIGHT ON and OFF. With the selector valve in the LEFT ON or RIGHT ON position, fuel from either the left or the right tank flows through a bypass in the auxiliary fuel pump (when it is not in operation), and through a strainer to an engine-driven fuel pump."*

*The engine-driven fuel pump delivers the fuel to the fuel/air control unit where it is metered and directed to a manifold which distributes it to each cylinder”.*

## **1.19 Useful or Effective Investigation Techniques**

1.19.1 None.

## **2 ANALYSIS**

### **2.1 Man**

2.1.1 The pilot was the holder of a valid commercial pilot's licence. He was in possession of a valid medical certificate with corrective lenses as a restriction endorsed on the certificate.

### **2.2 Machine**

2.2.1 Maintenance records revealed that the last MPI on the aircraft was certified on 21 July 2014 at 5 005,5 airframe hours by an approved AMO in possession of a valid AMO certificate.

2.2.2 The aircraft had a valid certificate of airworthiness and no recorded defects before the accident flight.

2.2.3 The aircraft flew a total of 3,5 hours after the certification of the last MPI.

2.2.4 After the accident, the engine was run in the airframe and on a test rig. During both of these runs the operation of the engine was found to be normal.

2.2.5 A total of 23ℓ of fuel were drained from the aircraft after the accident. The volume of fuel that had leaked from the damaged selector valve at the accident site could not be determined accurately.

### **2.3 Environment**

2.3.1 Fine weather prevailed at the time of the accident.

## **3 CONCLUSION**

### **3.1 Findings**

3.1.1 The pilot was properly certified and qualified according to regulations to perform this flight and was in possession of a valid medical certificate.

3.1.2 The aircraft had a valid certificate of airworthiness and was recorded as being serviceable at the time of the flight.

3.1.3 The aircraft had enough fuel on board to complete the flight to Gariep Dam.



- 3.1.4 The engine operated normally after the accident; no malfunction was evident during two ground runs.
- 3.1.5 The cause of the sudden engine stoppage could not be determined. It is possible that the fuel flow to the engine was interrupted due to the pilot mismanaging the fuel selection, which resulted in the right-hand fuel tank almost emptying, thus allowing air to enter the fuel system.
- 3.1.6 Weather conditions had no influence on the accident.

## **3.2 Probable Cause/s**

- 3.2.1 Unsuccessful forced landing following an engine failure shortly after take-off. The reason for the engine stoppage could not be determined.

## **4. SAFETY RECOMMENDATIONS**

- 4.1 None.

## **5. APPENDICES**

- 5.1 None.